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Agency

Office of Pesticides
and Toxic Substances
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Toxic Substances

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Guidance for Controlling Asbestos-Containing Materials in Buildings

EXHIBIT
33
Emergency Notice

GUIDANCE FOR CONTROLLING ASBESTOS-CONTAINING MATERIALS IN BUILDINGS

1985 EDITION

Exposure Evaluation Division
Office of Toxic Substances
Office of Pesticides and Toxic Substances
U.S. Environmental Protection Agency
Washington, D.C. 20460

Table 1. Factors for Assessing Potential Fiber Release
(See Appendix H for more detail.)

Current Condition of ACM

- Evidence of deterioration or delamination from the underlying surface (substrate)
- Evidence of physical damage (e.g., presence of debris)
- Evidence of water damage

Potential for Future Disturbance, Damage, or Erosion of ACM

- Proximity to air plenum or direct airstream
- Visibility, accessibility (to building occupants and maintenance personnel), and degree of activity (air movement, vibration, movement of building occupants)
- Change in building use

The factors in Table 1 are fully described in Appendix H. The descriptions should assist the evaluator in assessing ACM at individual sites.

A simple "present" or "absent," "high" or "low" rating should be used for each factor. More elaborate rating schemes have been tried. For example, factors have been assigned numerical scores and, using mathematical formulas, the scores have been combined into indices to reflect potential exposure.[1] These "exposure indices" have met with mixed success. In tests, several indices showed wide variation from one rater to the next and often did not indicate current, elevated airborne asbestos levels (e.g., USEPA 1983b). Assigning numerical ratings to assessment factors and combining them into a single score cannot be recommended. However, the factors are useful when they are scored with a simple, nonnumerical rating scheme.

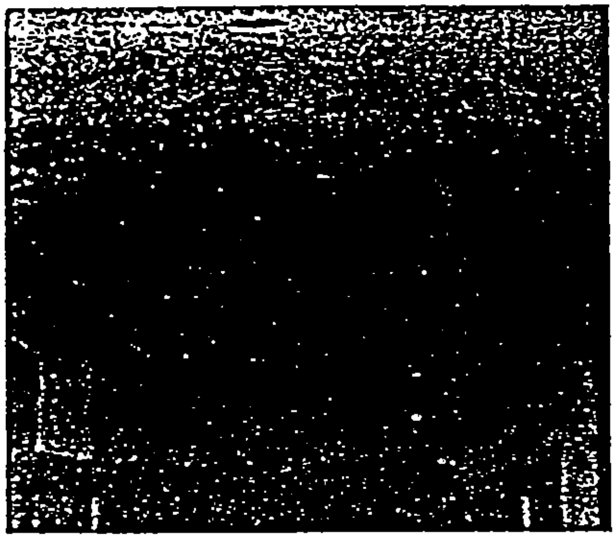
4.1.2 Air Monitoring

Another way to assess asbestos fiber release is to measure asbestos fibers in the air. This approach is appealing because it quantitatively measures airborne asbestos contamination. However, it measures only current conditions and provides no information about fiber release potential and future air levels. Moreover, implementing an effective monitoring program to measure current levels of airborne asbestos is difficult and can be expensive.

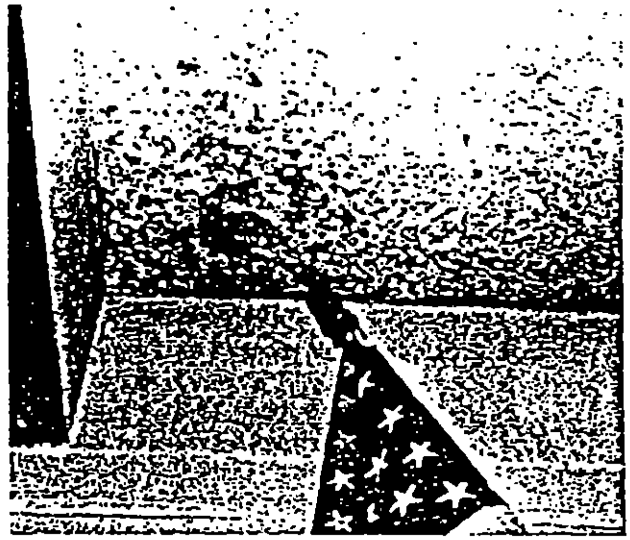
One proposed method for measuring airborne asbestos in buildings was developed by the National Institute for Occupational Safety and Health (NIOSH) in connection with the OSHA asbestos exposure standard for workplace settings. This method uses phase contrast microscopy (PCM), which may be effective for industrial measurements where most airborne fibers are asbestos, but is less useful in settings with much lower asbestos levels. PCM is not sensitive to fibers with diameters less than 0.2 micrometers.[2] In addition, the NIOSH method excludes fibers shorter than 5 micrometers and does not distinguish between

[1] See, for example, Lory 1980, Pinchin 1982, and USEPA 1979.

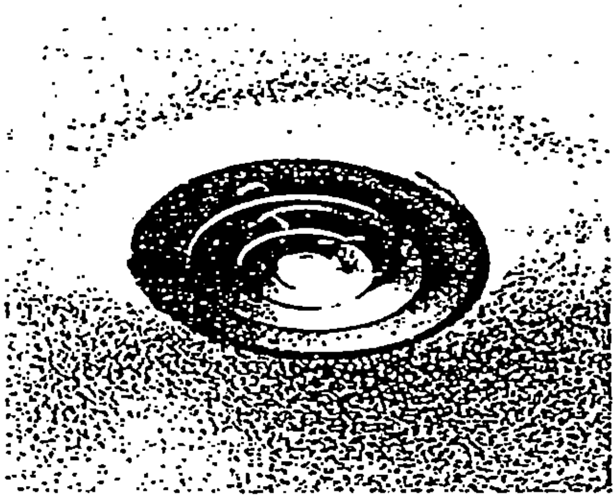
[2] A micrometer is one-millionth of a meter. See Appendix B for a simple discussion of measurement units used to describe and measure asbestos fibers.



Water damage



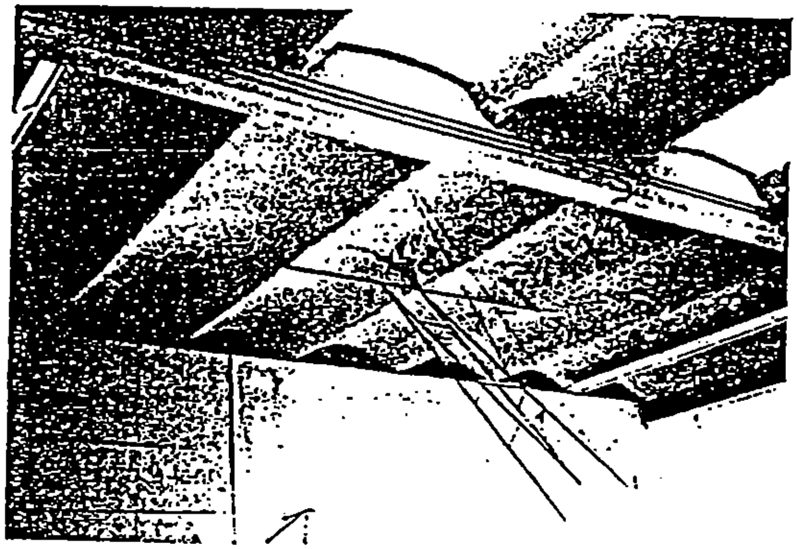
Physical damage to ceiling material from a flagpole



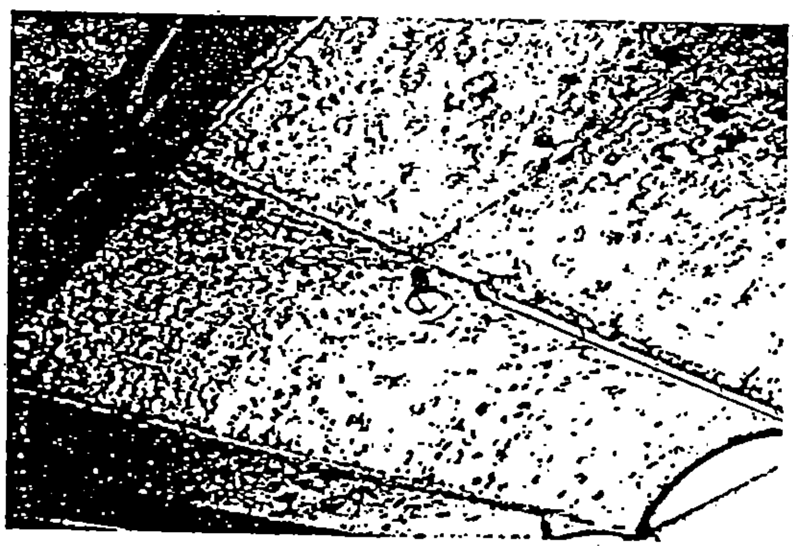
Airstream erosion from a heating vent

High activity level near friable asbestos

Figure 7. Example assessment characteristics of asbestos-containing materials.



Ceiling of a gymnasium in an elementary school
(no basketball marks)



Ceiling of a gymnasium in a high school showing evidence of damage from basketballs thrown by students

Figure 8. An example of the effect of a change in building use.

asbestos and non-asbestos fibers. Many airborne fibers in buildings with ACM are likely to be thinner and shorter than these limits (Chatfield 1983 and NRC 1984), and are likely to include fibers from carpets, clothing, hair, paper, books, and many other sources. As a result, PCM analyses of air inside these buildings could be seriously misleading.

Other methods measure both small and large fibers and distinguish asbestos from non-asbestos materials. Those methods count fibers by electron microscopy, and confirm that the fibers are asbestos with chemical and crystallographic analyses. The analytical transmission electron microscope (TEM)[3] is the most sensitive and asbestos-specific instrument. EPA has used TEM in experiments to establish baseline asbestos levels indoors and outdoors. However, obtaining enough samples to estimate prevalent airborne levels is difficult in occupied buildings. In addition, TEM analysis is expensive (ranging from $200 to $600 per sample) and few laboratories are qualified to perform it. These limitations, combined with the inability of air monitoring to provide information on future conditions, restrict its usefulness for assessment. EPA, therefore, does not recommend it as a primary assessment tool at this time. (Air monitoring does have a role, however, in determining when an abatement project is complete. See Section 6.4.)

4.2 The Assessment Process

The assessment factors discussed above are used to decide if additional asbestos control is needed and, if so, when and what method. Although the process is similar for each of the three types of ACM, the details are specific to each type and are discussed separately below.

4.2.1 Sprayed- and Troweled-on Surfacing Materials

4.2.1.1 Need

Use the factors described in 4.1.1 to determine the current condition of the ACM and the potential for future disturbance, damage, or erosion. Table 2 shows how these two considerations influence the decision regarding action beyond a special O&M program. Surfacing material in good condition may need no further action if potential for future disturbance, damage, or erosion is low. The material must be inspected regularly (see Section 3.3.1) to assure that it remains in good condition. Further action is needed if the material is damaged or in poor condition, or if there is high potential for future disturbance or erosion.

4.2.1.2 Timing

When further action is necessary, its timing must be carefully considered. A well-planned and executed abatement program is needed to ensure that the abatement activity itself does not create a hazard. If the ACM is currently in good condition, but the potential for future fiber release is high, scheduling of asbestos abatement can take advantage of other building plans. For example, renovation work, which requires precautions to control fiber release, provides an opportunity to remove, encapsulate, or enclose ACM. There are no set rules to determine the timing of asbestos abatement, since circumstances vary from building to building. Table 2 provides a guide.

As one moves through the table from left to right (from good to poor condition) and from top to bottom (from low to high potential for disturbance, damage, or erosion), the need for immediate action increases. Material in poor condition should be dealt with first. Materials that are in better condition or have a low potential for disturbance or erosion have a lower priority.

[3] A provisional method for TEM measurement of asbestos has been developed by EPA (USEPA 1977).